

NWS FORM E-5 U.S. DEPARTMENT OF COMMERCE NOAA, NATIONAL WEATHER SERVICE	HSA OFFICE: San Juan, PR (SJU)
MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS TO: NATIONAL WEATHER SERVICE HYDROMETEOROLOGICAL INFO CENTER, W/OS31 SSMC 2 – Room 13468 1325 EAST-WEST HIGHWAY SILVER SPRING, MD 20910-3283	REPORT FOR (MONTH / YEAR): October, 2004 DATE: November 2, 2004 SIGNATURE: Peter Corrigan
When no flooding occurs, include miscellaneous river conditions, such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (WSOM E-41).	

Summary: October 2004 brought no tropical storms or hurricanes across the San Juan Hydrologic Service Area (HSA), but there was still considerable hydrologic activity during the month. Many Urban and Small Stream Flood Advisories were issued and a number of Flash Flood Warnings. There was one flood-related fatality. At San Juan ASOS, rainfall amounted to 6.59 inches or 1.53" above normal. This was the 16th wettest October at San Juan since 1956 and the wettest since 1999. At St. Thomas, USVI (Truman Field) 4.24" fell versus a normal of 5.57".

The first several days of the month were relatively quiet across Puerto Rico and the US Virgin Islands, with only routine convection observed across favored areas. More widespread intense rains fell on the 5th, requiring the issuance of Urban and Small Stream Flood Advisories for 16 municipalities extending from the far west to the central mountains. Rainfall in excess of 3 inches was recorded at several gages including 3.50" at Lago El Guineo (VILP4) and 3.45" at Adjuntas-Barrio Saltillo (ADSP4). A similar pattern developed on the 6th as precipitable water (PWAT) remained high (1.94" at 1200 UTC) and strong storms formed over the central and western mountain areas. Very heavy rain fell in and around Adjuntas, with Lago Garzas (ADJP4) picking up 4.38" in just 2 hours, 3.05" of it in 1 hour. The reservoir level jumped two feet with the heavy rains and runoff downstream pushed the Rio Grande de Arecibo near Hwy 135 very close (11.89 ft.) to the Flood Stage of 12 feet, and a discharge of 5780 cubic feet per second (cfs). Urban and Small Stream Flood Advisories were issued for 17 municipalities from San German through Barranquitas.

Scattered showers and thunderstorms moved across northeast Puerto Rico during the morning hours of the 7th, causing some minor urban flooding in the San Juan metropolitan area for which a Flood Advisory was issued. Another advisory issued in the afternoon covered several municipalities in the south central part of the island, as radar estimated 2 to 4 inches in several hours. Rain gage amounts were considerably less. Atmospheric moisture remained abundant from the 8th through the 12th with precipitable water remaining close to or above 2.00" each sounding. Rainfall was scattered across the island during this period, with generally 1 to 2 inch amounts in the heavier showers. Activity on the 8th was centered over the south central mountains, whereas the 9th and 10th saw the activity focused over the north central coast and mountains. A strong thunderstorm over the Vega Baja area on the 9th reportedly produced some hail (up to 1" in diameter) and roof damage. Rainfall at the Rio Cibuco at Vega Baja (VGBP4) gage was 1.95" and Toa

Alta at Highway 2 (TOAP4) had 1.49".

A Flood Watch for Flash Flooding was issued around midday on the 10th for most of the northern half of Puerto Rico and a Flash Flood Warning for Caguas in mid-afternoon. No reports of flooding were received from Caguas, although both the Rio Gurabo (GURP4) and Rio Grande de Loiza at Caguas (CAGP4) rose above Action Stage as a result of the heavy rainfall. The highest rain gage totals included Corozal (CRZP4), 2.72"; San Sebastian (SEBP4), 2.71"; Vaqueria El Mimo at Caguas (BZCP4), 2.64" and Rio Grande de Loiza at Caguas, 1.65".

Activity on the 11th was also fairly widespread (22 Flood Advisories issued) primarily across the northeast and central high terrain, with the highest amounts 2.45" at Rio De Bayamon at Arenas (CIFP4); 1.86" at Rio Pellejas (ADLP4) and 1.58" at Adjuntas (ADKP4). Convection was again intense in localized areas on the 12th, with especially heavy rainfall over the central mountains and northern foothills. Urban and Small Stream Advisories were eventually posted for 41 municipalities during the day (some were extended from earlier in the day) and a Flash Flood Warnings issued at 345 LST for Corozal, Morovis, Utuado and Lares. WSR-88D and Multisensor Precipitation Estimates (MPE) ranged from 3 to 6 inches in some of these areas. Some of the heaviest rain fell over the high terrain of the Rio Toro Negro basin, which drains into the Rio Grande de Manati. A rapid rise ("golpe de agua") in this river caused a tragic loss of life in Ciales municipality, as a 39-year old woman in a sport utility vehicle was drowned while attempting to transit a low water crossing on Road 615. A greater tragedy was narrowly averted as six teenagers managed to escape from the same vehicle. Flood Watches for potential river flooding were issued later in the day for parts of the Rio Grande de Arecibo, Rio Tanama and Rio Camuy. 24-hour rainfall totals at 1200 UTC on the 13th included 4.56" at Rio Tanama near Utuado (UTHP4); 2.64" at Barrio Roncador near Utuado (UTKP4); 1.93" at Adjuntas 2 NW (ADKP4) and 1.84" at Caguas (CAGP4).

This scenario was nearly repeated the following day (the 13th) as the meteorological situation remained similar, very high precipitable water (>2.00"), the influence of an upper trough and light southwest flow. A Flood Watch for Flash Flooding issued for much of the northern half of Puerto Rico around midday, followed by numerous Urban/Small Stream Flood Advisories (46) and one Flash Flood Warning (Yabucoa). Unconfirmed reports of several river rescues were reported during the day, on the Rio Coamo and along the Rio Hondo. Precipitation amounts were down somewhat from the previous day, but several stations had around two inches, including 2.25" at Boca Grande near Jayuya (JACP4); 1.83" at Bairoa Arriba (BZBP4); and 1.72" at Rio Valenciano near Juncos (VALP4). There was fairly strong convective activity on the 14th and 1 to 2 inches fell in the west central highlands, although no flood advisories or warnings were issued. A dramatic reduction in mid-level moisture and overall instability across the northeast Caribbean early on the 15th resulted in weak or negligible convection for first day in over a week. This dry and more stable air mass remained in place across the region for several days, providing a respite from the hydrologic activity.

This break lasted until the 18th when pockets of heavy rainfall, estimated by radar at up to 4 inches, fell over the west central mountains. Significant rain gage reports included 2.52" at Lago Guayo (LGUP4) and 2.32" at Rio Grande de Arecibo near Utuado (UTUP4). Urban/Small Stream Flood Advisories were issued for four municipalities in this area. A wetter pattern commenced on the 20th as elevated moisture and an upper level trough brought enhanced precipitation activity to the region. Rainfall was heaviest over eastern Puerto Rico and the offshore islands. A Flood Statement was issued in the early morning for St. Croix, with radar estimates of 1 to 2 inches, and higher estimates over Vieques and Culebra. Flood Advisories were posted for 22 additional municipalities during the day and another 32 (issued

or extended) early on the 21st. Twenty-four hour gage rainfall ending 1200 UTC on the 21st reached 2.49" at Isabela Segunda in Vieques (WVEP4), 2.35" at Duque 2NE (NGBP4), 2.21" at Rio Mameyes near Sabana (MSAP4), 2.16" at Rio Blanco near Florida (NGKP4) and 2.13" at Rio Pellejas (ADLP4). The forecast of additional rains on the 21st prompted a Flood Watch for Flash Flooding to be issued for much of Puerto Rico and the Virgin Islands, although very little of this forecast rainfall developed. The 22nd and 23rd remained active across portions of the islands, primarily over north coastal and far southwest Puerto Rico. Flood Advisories were issued or extended for another 46 municipalities these days, although no flood reports were received by the NWS. The 24th saw convection confined to the southeast and central mountains, with a handful (5) of Flood Advisories over the far southeast.

A period of quiescent weather predominated across Puerto Rico and the U.S. Virgin Islands for several days as much drier air under rare northwest flow moved across the region. However, activity resumed the last few days of the month as scattered showers developed over the far east and south on the 29th. This produced some minor flooding on the Rio Sabana at Sabana, which rose quickly from around 8 (9 cfs) to over 15.4 feet (4,120 cfs) in an hour. An Urban and Small Stream Flood Advisory was issued for three municipalities based on rainfall of 5 to 6 inches on the WSR-88D in 3 hours. 24-hour rainfall (most of which fell in 1 to 3 hours) ending 1200 UTC on the 30th showed 3.49" at Bisley Met. station (MSCP4); 2.87" at Rio Mameyes (MSAP4), 2.43" at Rio Cibuco nr. Vega Baja (VGBP4), and 2.02" at Rio Fajardo (FAJP4). Strong dynamics associated with a deepening trough over Hispaniola combined with a surge in low-level moisture (PWATs increased from 1.60" at 1200 UTC on the 29th to 2.06" at 0000 UTC on the 31st) to produce more widespread and intense convection over Puerto Rico the last two days of the month. Activity on the 30th was heaviest over the western interior and far east. Flash Flood Warnings were issued for Juan Diaz and Lares in the afternoon after radar estimated 3 to 5 inches of rain. A Flood Watch was posted for the Rio Culebrinas and Rio Grande de Anasco, and both crested above Action Stage but below Flood Stage. The Rio Guajataca at Lares (LARP4) crested above flood stage, as did the Rio Cerrillos above Lago Cerrillos (PCEP4) in Ponce but no other reports of flooding were received. An additional 30 municipalities were under Urban/Small Stream Flood Advisories during the day. Rain gage totals included 3.20" at San Sebastian (SEBP4); 2.90" at Rio Guajataca at Lares (LARP4); 1.93" at Villalba 3NE (VINP4), and 1.89" at Rio Cerrillos (PCEP4).

The last day of the month turned out to be the most hydrologically active, with another 55 Urban/Small Stream Flood Advisories and 11 Flash Flood Warnings put out by the San Juan WFO. A very unstable air mass remained across the island (K index of 37 and CAPE of 3565 J/Kg on the 1200 UTC sounding) and convection was widespread across the central interior and especially the northeast quadrant of the island. During the afternoon a Flash Flood Warning was issued for the western portions of the San Juan metro area. A report of water over a road in Barrio Lomas, Naranjito was received by the NWS. The strong dynamics of this system sustained the convection through much of the night over the northeast, prompting numerous Flood Advisories and another Flash Flood Warning for four eastern municipalities. Evidence of flash flooding was observed after the event along the Rio Canovanas, which quickly exceeded its banks after about 2 to 4 inches fell in the basin. The river surged from about 2.5 feet (16 cfs) to 13.12 (9,260 cfs) feet in one hour, covering Route 962 near Barrio Cambalache for perhaps 30 minutes. Rainfall amounts included 2.95 at Rio Canovanas near Campo Rico (CNAP4); 2.89" at Rio Humacao (PIEP4); 2.60" at Rio Piedras at Hato Rey (RPOP4) and 2.47" at Jagueyes Abajo (BZAP4).

Non-Routine Hydrologic Products Issued:

Hydrologic Outlooks (SJUESFSJU):	0
Flood Watches (SJUFFASJU):	8
Flood Warnings (SJUFLWSJU):	0
Flash Flood Warnings (SJUFFWSJU):	19
Urban/Small Stream Flood Advisories: (SJUFLSSJU)	380

cc: USGS Caribbean District
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